PURCHASE DESCRIPTION

SYNTHESIZED SIGNAL GENERATOR (100 kHz to 2.0 GHz)

FSNST-A

1.0 GENERAL This procurement requires a programmable synthesized signal generator employing no more then two plug-ins and covering a frequency range of 100 kHz to 2.0 GHz.

2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800( ), Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications with the following exceptions:

a. The relative humidity requirement is limited to 95% non-condensating.

b. The operating and non-operating altitude requirements are not invoked.

c. The Electromagnetic Interference requirements of MIL-T-28800( ) are limited to CE01, CE03, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (back panel search excluded), RE02 (14 kHz to 1 GHz), and RS03.

d. The warm-up time is extended to 2 hours.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics {F = carrier frequency}

3.1.1 Frequency Range: At least 100 kHz to 2.0 GHz

3.1.2 Frequency Resolution: At least 1 Hz

3.1.3 Frequency Stability (CW mode)

3.1.3.1 Internal: $< \pm 1$ pp 10^9/hr
3.1.3.2 Temperature: < 1 pp 10^7 [0-50˚C]
3.1.3.3 External: Equal to external standard frequency stability

3.1.4 Spectral Purity (Level $\leq$ 10 dBm)

3.1.4.1 Harmonics/Sub-harmonics: At least -25 dBc
3.1.4.2 Non-Harmonics/Spurious: At least -60 dBc [>15 kHz from carrier]

3.1.4.3 Signal Sideband Phase Noise: ≤ -120 dBc/Hz [at 10 kHz offset]
3.1.4.4 Residual AM: < 0.1% rms [50 Hz to 15 kHz BW]
3.1.4.5 Residual FM: < 25 Hz rms [50 Hz to 15 kHz BW]

3.1.5 Reference Frequency

3.1.5.1 Internal: 10 MHz
3.1.5.1.1 Output Level: > 0.1 Vrms into 50 Ω BNC female connector
3.1.5.2 External: 5 or 10 MHz
3.1.5.2.1 Input Level: > 0.5 Vrms into 50 Ω BNC female connector

3.2 Output Characteristics

3.2.1 Range: +13 to -127 dBm

3.2.2 Accuracy: Within ±1.5 dB

3.2.2.1 Resolution: 0.1 dB

3.2.3 Flatness: ±1.0 dB [measured at 0 dBm]

3.2.4 Output Impedance/Connector: 50 Ω; Type-N

3.2.4.1 VSWR: < 2.0 [Level < 0 dBm]

3.2.5 Reverse Power Protection

3.2.5.1 Max CW power: 25 W
3.2.5.2 Max dc voltage: 25 V

3.3 Modulation Characteristics {F = carrier frequency}

3.3.1 Amplitude Modulation (AM) {Level ≤ 0 dBm}

3.3.1.1 Internal AM [F > 10 MHz]
3.3.1.1.1 Rate: At least 20 Hz to 50 kHz
3.3.1.1.2 Depth: 0 to 99%
3.3.1.1.3 Accuracy: ±7% of selected depth [< 90% depth @1 kHz]
3.3.1.1.4 Distortion: ≤ 5% [50% depth @1 kHz]
3.3.1.1.5 Incidental øM: < 0.3 radians [30% depth @ 1 kHz] [50 Hz to 15 kHz BW]

3.3.1.2 External AM [F > 10 MHz]
3.3.1.2.1 Rate: At least 20 Hz to 50 kHz
3.3.1.2.2 Depth: 0 to 99%
3.3.1.2.3 Sensitivity: < 1 Vrms (produce selected depth within 10%)
3.3.1.2.4 Distortion: ≤ 5% [50% depth @ 1 kHz]
3.3.1.2.5 Input Impedance: 600 ohms
3.3.2 Frequency Modulation (FM) {ΔF = FM deviation}

3.3.2.1 Internal FM [F > 10 MHz]

3.3.2.1.1 Rate: At least 20 Hz to 100 kHz (synthesized)
3.3.2.1.2 Deviation: At least 0 to 100 kHz
3.3.2.1.3 Accuracy: ±5% of set value + 20 Hz
3.3.2.1.4 Distortion: ≤ 2% [ΔF = 20 kHz @ 1 kHz]

3.3.2.2 External FM [F > 10 MHz]
3.3.2.2.1 Rate: At least DC to 100 kHz
3.3.2.2.2 Deviation: At least 0 to 100 kHz
3.3.2.2.3 Distortion: ≤ 2% [ΔF = 20 kHz @ 1 kHz]
3.3.2.2.4 Incidental AM: < 1% [ΔF = 20 kHz @ 1 kHz] [50 Hz to 15 kHz BW]
3.3.2.2.5 Input Impedance: 600 ohms

3.3.3 Phase Modulation (ØM) {Δø = ØM deviation}

3.3.3.1 Internal ØM
3.3.3.1.1 Rate: At least 20 Hz to 10 kHz
3.3.3.1.2 Deviation: At least 0 to 4 radians
3.3.3.1.3 Accuracy: ±10%
3.3.3.1.4 Distortion: ≤ 3% [Δø = 2 rad @ 1 kHz]

3.3.3.2 External ØM
3.3.3.2.1 Rate: At least 20 Hz to 10 kHz
3.3.3.2.2 Deviation: At least 0 to 4 radians
3.3.3.2.3 Accuracy: ±10%
3.3.3.2.4 Distortion: ≤ 3% [Δø = 2 rad @ 1 kHz]
3.3.2.2.5 Incidental AM: < 1% depth [Δø = 2 rad @ 1 kHz] [50 Hz to 15 kHz BW]
3.3.3.2.6 Input Impedance: 600 ohms

3.3.4 Pulse Modulation {PM}

3.3.4.1 External PM [F> 10 MHz]
3.3.4.1.1 Rate: At least 20 Hz to 1 MHz
3.3.4.1.2 Min Pulse Width: < 500 nsec
3.3.4.1.3 ON/OFF ratio: > 50 dB
3.3.4.1.4 Rise/Fall Time: < 100 nsec
3.3.4.1.5 Level: > 3 Vpk ON; < 1 Vpk OFF

4.0 GENERAL REQUIREMENTS

4.1 Power: 115/230 Vac ±10%, single phase, 50-60 Hz ±5%, 200 VA maximum

4.2 Dimensions: The total volume of the unit shall not exceed 49200 cm^3 (3000 in^3).

4.3 Weight: The total weight of the unit shall not exceed 27.3 kg (60 lbs).

4.4 Calibration Interval: The calibration interval shall be 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.5 Remote Programming: The generator shall be capable of being remotely controlled via the

IEEE-488( ) interface bus, operating as both a talker and listener, having at least the following subset of bus functions: AH1, L4, SH1, T6, SR1, DC1, and RL1.